AMENDMENTS TO THE CLAIMS:

Claims 2-11, 13-22, 24-26, 28-38, 41-48, 50, 52, and 54-65 were pending at the time of the Final Office Action.

Claims 1, 12, 22, 23, 27, 39, 40, 49, 51, and 53 are hereby (or have previously been) cancelled.

Claims 5-8, 24, and 25 are hereby requested to be amended.

Claims 2-11, 13-21, 24-26, 28-38, 41-48, 50, 52, and 54-65 remain pending.

1. (Cancelled)

2. (Previously Presented) The method of Claim 10, further comprising determining a value I_r of infrared energy reflected from a reference composite surface.

3. (Original) The method of Claim 2, further comprising comparing I_s with I_r.

4. (Previously Presented) The method of Claim 19, wherein the second wavenumber is around 2000 cm-1.

5. (Currently Amended) The method of Claim 10, wherein determining the infrared absorbance includes using an ~~the~~ infrared spectrometer ~~includes an infrared filter spectrometer~~.

6. (Currently Amended) The method of Claim 10, wherein determining the infrared absorbance includes using at least one of an ~~the~~ infrared filter spectrometer and ~~includes~~ an ellipsoidal mirror collector.

7. (Currently Amended) The method of Claim 10, wherein determining the infrared absorbance includes using ~~the infrared spectrometer includes~~ an attenuated total reflectance collector.

8. (Currently Amended) The method of Claim 10, wherein determining the infrared absorbance includes using an ~~the~~ infrared spectrometer having ~~includes~~ at least two filters.

9. (Original) The method of Claim 8, wherein the at least two filters include narrow bandpass infrared filters.

10. (Previously Presented) A non-destructive method for determining an amount of heat exposure to a resin-fiber composite substrate, the method comprising:

non-destructively determining a value I_s of infrared energy reflected by a surface on the composite substrate; and

correlating the value I_s of the infrared energy reflected to an amount of heat exposure, wherein determining I_s includes determining absorbance at at least one wavenumber wherein increased infrared absorbance reflects exposure by the composite substrate to heat greater than 300 degrees F.

11. (Original) The method of Claim 10, wherein the at least one wavenumber is around 2174 cm-1.

12. (Cancelled)

13. (Original) The method of Claim 10, wherein the at least one wavenumber is around 1783 cm-1.

14. (Original) The method of Claim 10, wherein the at least one wavenumber is around 1727 cm-1.

15. (Original) The method of Claim 10, wherein the at least one wavenumber is around 1767 cm-1.

16. (Original) The method of Claim 10, wherein the at least one wavenumber is around 1692 cm-1.

17. (Original) The method of Claim 10, wherein the at least one wavenumber is around 1678 cm-1.

18. (Original) The method of Claim 10, wherein the at least one wavenumber is around 1522 cm-1.

19. (Previously Presented) The method of Claim 10, wherein correlating the infrared absorbance to an amount of heat exposure of the sample includes determining a difference between infrared absorbance of the composite substrate at at least two wavenumbers, wherein absorbance at a second wavenumber is subtracted from absorbance from a first wavenumber, and a difference greater than a threshold amount reflects exposure of the composite substrate to heat greater than 300 degrees F.

20. (Previously Presented) The method of Claim 19, wherein the first wavenumber is around 1522 cm-1 and the second wavenumber is around 1678 cm-1 and the threshold amount is approximately 0.07.

21. (Previously Presented) The method of Claim 19, wherein the first wavenumber is around 1629 cm-1 and the second wavenumber is around 2174 cm-1 and the threshold amount is greater than 0.15.

22. (Cancelled)

23. (Cancelled)

24. (Currently Amended) The method of Claim 25 ~~22~~, wherein determining the infrared absorbance includes using an infrared spectrometer.

25. (Currently Amended) A non-destructive method for determining an amount of heat damage to a resin-fiber composite sample, the method comprising: ~~The method of Claim 22~~

transmitting an infrared beam onto a sample of a resin-fiber composite, wherein transmitting an infrared beam includes transmitting the infrared beam in a direction approximately in alignment with fibers in the sample;

detecting a reflected infrared beam reflected by the sample;

determining infrared absorbance of the sample; and

correlating the infrared absorbance to an amount of heat damage to the sample, wherein correlating the infrared absorbance includes determining absorbance at at least one wavenumber wherein increased absorbance reflects exposure by the composite sample to heat greater than 300 degrees F.

26. (Original) The method of Claim 25, wherein the at least one wavenumber is around 2174 cm-1.

27. (Cancelled)

28. (Original) The method of Claim 25, wherein the at least one wavenumber is around 1783 cm-1.

29. (Original) The method of Claim 25, wherein the at least one wavenumber is around 1727 cm-1.

30. (Original) The method of Claim 25, wherein the at least one wavenumber is around 1767 cm-1.

31. (Original) The method of Claim 25, wherein the at least one wavenumber is around 1692 cm-1.

32. (Original) The method of Claim 25, wherein the at least one wavenumber is around 1678 cm-1.

33. (Original) The method of Claim 25, wherein the at least one wavenumber is around 1522 cm-1.

34. (Previously Presented) The method of Claim 25, wherein correlating the infrared absorbance to an amount of heat damage of the sample includes deriving a difference between infrared absorbance at at least two wave numbers wherein absorbance at a second wavenumber is subtracted from absorbance from a first wavenumber, and a difference greater than a threshold amount reflects exposure by the composite substrate to heat greater than 300 degrees F.

35. (Previously Presented) The method of Claim 34, wherein deriving a difference between infrared absorbance of the sample at at least two wavenumbers includes deriving a difference between infrared absorbance at a first wavenumber of around 1522 cm-1 and at a second wavenumber of around 1678 cm-1.

36. (Previously Presented) The method of Claim 34, wherein deriving a difference between infrared absorbance of the sample at at least two wavenumbers includes deriving a difference between infrared absorbance at a first wavenumber of around 1692 cm-1 and at a second wavenumber of around 2174 cm-1.

37. (Previously Presented) The method of Claim 25, wherein detecting a reflected infrared beam reflected by the sample includes filtering the reflected infrared beam.

38. (Original) The method of Claim 37, wherein filtering the reflected infrared beam includes utilizing at least two filters.

39. (Canceled)

40. (Cancelled)

41. (Previously Presented) The method of Claim 47, wherein determining at least one of the first infrared absorbance and the second infrared absorbance includes using an infrared filter spectrometer.

42. (Previously Presented) The method of Claim 47, wherein the first wavenumber is around 1678 cm-1, the second wavenumber is around 2000 cm-1, and the first difference is greater than approximately 0.07.

43. (Previously Presented) The method of Claim 47, wherein the first wavenumber is around 1767 cm-1, the second wavenumber is around 2000 cm-1, and the first difference is greater than approximately 0.04.

44. (Previously Presented) The method of Claim 47, wherein the first wavenumber is around 2174 cm-1, the second wavenumber is around 2000 cm-1, and the first difference is greater than approximately 0.04.

45. (Previously Presented) The method of Claim 47, wherein the first wavenumber is around 1783 cm-1, the second wavenumber is around 2000 cm-1, and the first difference is greater than approximately 0.04.

46. (Previously Presented) The method of Claim 47, wherein the first wavenumber is around 1727 cm-1, the second wavenumber is around 2000 cm-1, and the first difference is greater than approximately 0.075.

47. (Previously Presented) A non-destructive method for determining an amount of heat exposure of a resin-fiber composite sample, the method comprising:

transmitting an infrared beam onto a sample of resin-fiber composite;

detecting a reflected infrared beam reflected by the sample;

determining a first infrared absorbance of the sample from the reflected infrared beam at a first wavenumber, wherein the first wavenumber corresponds with an infrared spectra of a heat damaged composite surface;

determining a second infrared absorbance of the sample from the reflected infrared beam at a second wavenumber, and the second wavenumber corresponds with an infrared spectra of a heat damaged composite surface;

deriving a first difference between the first infrared absorbance and the second infrared absorbance; and

quantitatively determining an amount of heat exposure by correlating the first difference to a plurality of reference samples exposed to various amounts of heat.

48. (Previously Presented) The method of Claim 47, wherein the first wavenumber is around 1522 cm-1, the second wavenumber is around 1678 cm-1, and the first difference is less than approximately 0.2.

49. (Cancelled)

50. (Previously Presented) The method of Claim 47, wherein the first wavenumber is around 1692 cm-1, the second wavenumber is around 2174 cm-1, and the first difference is less than approximately 0.15.

51. (Cancelled)

52. (Previously Presented) A non-destructive method for determining a degree of heat exposure of a resin-fiber composite substrate, the method comprising:

determining an alignment direction of fibers in the substrate;

transmitting an infrared beam onto the substrate in alignment with the alignment direction;

filtering with a first filter a reflected infrared beam reflected by the substrate;

detecting a first filtered portion of the reflected infrared beam;

determining a first infrared absorbance of the substrate; and

correlating the first infrared absorbance to a degree of heat exposure by comparison to a plurality of reference samples exposed to various amounts of heat, including at least one reference sample exposed to temperatures over 300 degrees F.

53. (Cancelled)

54. (Original) The method of claim 52 wherein determining a first infrared absorbance includes determining absorbance at a wavenumber of around 2174 cm-1.

55. (Original) The method of claim 52 wherein determining a first infrared absorbance includes determining absorbance at a wavenumber of around 2000 cm-1.

56. (Original) The method of claim 52 wherein determining a first infrared absorbance includes determining absorbance at a wavenumber of around 1783 cm-1.

57. (Original) The method of claim 52 wherein determining a first infrared absorbance includes determining absorbance at a wavenumber of around 1727 cm-1.

58. (Original) The method of claim 52 wherein determining a first infrared absorbance includes determining absorbance at a wavenumber of around 1767 cm-1.

59. (Original) The method of claim 52 wherein determining a first infrared absorbance includes determining absorbance at a wavenumber of around 1692 cm-1.

60. (Original) The method of claim 52 wherein determining a first infrared absorbance includes determining absorbance at a wavenumber of around 1678 cm-1.

61. (Original) The method of claim 52 wherein determining a first infrared absorbance includes determining absorbance at a wavenumber of around 1522 cm-1.

62. (Original) The method of Claim 52, further comprising:
filtering with a second filter a reflected infrared beam reflected by the substrate;
detecting a second filtered portion of the reflected infrared beam; and
determining a second infrared absorbance of the substrate.

63. (Original) The method of Claim 62, further comprising subtracting the second infrared absorbance from the first infrared absorbance.

64. (Original) The method of claim 62 wherein determining a first infrared absorbance includes determining absorbance at a wavenumber of around 1522 cm-1, and determining a second infrared absorbance includes determining absorbance at a wavenumber of around 1678 cm-1.

65. (Original) The method of claim 62 wherein determining a first infrared absorbance includes determining absorbance at a wavenumber of around 1692 cm-1, and determining a second infrared absorbance includes determining absorbance at a wavenumber of around 2174 cm-1.